

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	Inoue et al.	Art Unit:	Not Yet Assigned
Serial No.:	10/587,123	Examiner:	Not Yet Assigned
Filed:	July 24, 2006	Customer No.:	21559
Title:	METHOD FOR PRODUCING VIRAL VECTORS (AS AMENDED)		

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Commissioner for Patents  
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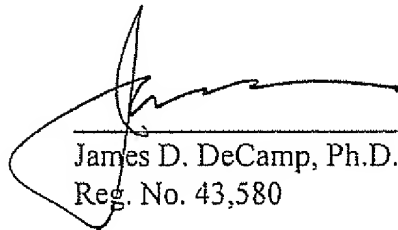
SUBMISSION OF TRANSLATION OF  
INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

Applicants submit herewith the Translation of the International Preliminary Report on Patentability corresponding to the above-referenced application. Applicants petition for any necessary extensions of time for submission of this document.

In addition, if there are any charges, or any credits, please apply them to Deposit  
Account No. 03-2095.

Respectfully submitted,

Date: 26 December 2006



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TRANSLATION

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>D3-A0401P</b>	FOR FURTHER ACTION	See Form PCT/IPEA/16
International application No. <b>PCT/JP2005/000708</b>	International filing date (day/month/year) <b>20.01.2005</b>	Priority date (day/month/year) <b>22.01.2004</b>
International Patent Classification (IPC) or national classification and IPC <b>C12N15/45, C12N15/64, C12N7/00</b>		
Applicant <b>DNAVEC RESEARCH INC.</b>		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.	
2. This REPORT consists of a total of <u>6</u> sheets, including this cover sheet.	
3. This report is also accompanied by ANNEXES, comprising:	
a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:	
<input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).	
<input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.	
b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 602 of the Administrative Instructions).	
4. This report contains indications relating to the following items:	
<input checked="" type="checkbox"/> Box No. I	Basis of the report
<input type="checkbox"/> Box No. II	Priority
<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/> Box No. VI	Certain documents cited
<input type="checkbox"/> Box No. VII	Certain defects in the international application
<input type="checkbox"/> Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2005/000708

Box No. 1

Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following \_\_\_\_\_ which is the language of a translation furnished for the purposes of:

- ☐ international search (Rule 12.3 and 23.1(b))  
☐ publication of the international application (Rule 12.4)  
☐ international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

☒ the international application as originally filed/furnished

☐ the description:

pages \_\_\_\_\_ as originally filed/furnished

pages<sup>a</sup> \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages<sup>a</sup> \_\_\_\_\_ received by this Authority on \_\_\_\_\_

☐ the claims:

nos. \_\_\_\_\_ as originally filed/furnished

nos.<sup>a</sup> \_\_\_\_\_ as amended (together with any statement) under Article 19

nos.<sup>a</sup> \_\_\_\_\_ received by this Authority on \_\_\_\_\_

nos.<sup>a</sup> \_\_\_\_\_ received by this Authority on \_\_\_\_\_

☐ the drawings:

sheets \_\_\_\_\_ as originally filed/furnished

sheets<sup>a</sup> \_\_\_\_\_ received by this Authority on \_\_\_\_\_

sheets<sup>a</sup> \_\_\_\_\_ received by this Authority on \_\_\_\_\_

☒ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages \_\_\_\_\_

☐ the claims, nos. \_\_\_\_\_

☐ the drawings, sheets/figs \_\_\_\_\_

☐ the sequence listing (specify): \_\_\_\_\_

☐ any table(s) related to sequence listing (specify): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages \_\_\_\_\_

☐ the claims, nos. \_\_\_\_\_

☐ the drawings, sheets/figs \_\_\_\_\_

☐ the sequence listing (specify): \_\_\_\_\_

☐ any table(s) related to sequence listing (specify): \_\_\_\_\_

<sup>a</sup> If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2005/000708

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	<u>1-10, 13, 14, 16-18, 22-35</u>	YES
	Claims	<u>11, 12, 15, 19-21</u>	NO
Inventive step (IS)	Claims	<u></u>	YES
	Claims	<u>1-35</u>	NO
Industrial applicability (IA)	Claims	<u>1-35</u>	YES
	Claims	<u></u>	NO

## 2. Citations and explanations (Rule 70.7)

Document 1: Heminaway BR et al., "Role of basic residues in the proteolytic activation of Sendai virus fusion glycoprotein", Virus Research, 1995, April, 36 (1), pages 15 to 35

Document 2: Hsu MC et al., "Protease activation mutants of Sendai virus: sequence analysis of the mRNA of the fusion protein (F) gene and direct identification of the cleavage-activation site", Virology, 1987, January, 156 (1), pages 84 to 90

Document 3: Li Ho et al., "A cytoplasmic RNA vector derived from nontransmissible Sendai virus with efficient gene transfer and expression", J. Virol, 2000, July, (14), pages 6564 to 6569

Document 4: Maisner A. et al., "Recombinant measles virus requiring an exogenous protease for activation of infectivity", J. Gen. Virol., February 2000, 81 (Pt 2), pages 441 to 449

Document 5: Donald F et al., "The new enzymology of precursor processing endoprotease", J. Biol. Chem., November 1992, 267 (33), pages 23435 to 23438

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability:  
citations and explanations supporting such statement

Claims 11, 12, 15 and 19 to 21

Document 1 sets forth a plasmid vector which codes a modified virus protein wherein the protease cleavage sequence in the F protein of Sendai virus has been modified into the cleavage sequence by endogenous protease of a cell, therefore the invention set forth in claims 11, 12, 15 and 19 to 21 lacks novelty in the light of document 1.

Claims 1 to 4, 8 to 15, 19 to 29 and 33 to 35

Document 2 indicates that the activation by F protein protease of paramyxovirus, and the resultant host region and infection tissue is changed by the mutation in the F protein cleavage site. Document 1 sets forth the production of F protein of Sendai virus modified in such a manner that the protease cleavage sequence in the F protein of Sendai virus is modified into the cleavage sequence by endogenous protease of host cells, and activated by endogenous protease of host cells. Document 3 indicates that when using Sendai virus lacking F protein as a vector, helper cells which express F protein are used to cleave and activate F protein using trypsin.

That being the case, it would be easy for a person skilled in the art to conceive of introducing a mutant in order to have the protease cleavage sequence in F protein be recognized by endogenous protease to cleave and activate host cells by endogenous protease as an alternative to cleavage and activation by trypsin, in the method of using helper cells which express F protein set forth in document 3, in the light of documents 1 and 2. Moreover, the effect offered by doing so would not surpass that which would be expected by a person skilled

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2005/000708

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

in the art.

Therefore the invention set forth in claims 1 to 4, 8 to 15, 19 to 29 and 33 to 35 does not involve an inventive step in the light of documents 1 to 3.

Claims 5 to 7, 16 to 18 and 30 to 32

Document 4 indicates that ferrin contributes to the cleavage and activation of F protein of paramyxovirus as a ubiquitous protease, and document 5 sets forth a ferrin recognition sequence. It would therefore not be particularly technically difficult for a person skilled in the art to select a ferrin cleavage sequence as a protease cleavage sequence, taking versatility into account. Moreover, the effect offered by doing so would not surpass that which would be expected by a person skilled in the art.

Therefore the invention set forth in claims 5 to 7, 16 to 18 and 30 to 32 does not involve an inventive step in the light of documents 1 to 5.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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## Supplemental Box Relating to Sequence Listing

## Continuation of Box No. I, item 2:

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this report was established on the basis of:

## a. type of material



a sequence listing



table(s) related to the sequence listing

## b. format of material



in written format



in computer readable form

## c. time of filing/furnishing



contained in the international application as filed



filed together with the international application in computer readable form



furnished subsequently to this Authority for the purposes of search and/or examination

received by this Authority as an amendment<sup>a</sup> on \_\_\_\_\_

2. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional comments:

<sup>a</sup> If item 4 in Box No. I applies, the listing and/or table(s) related thereto, which form part of the basis of the report, may be marked "superseded."